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Do men delay too? Men, women, occupation and childbearing: A cohort analysis of first birth in Scotland in times of low fertility

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Abstract

In the period following the turn of the Century European total fertility rates (TFR) dropped to well below replacement. Work examining this highlights that cohort postponement in births contributes to low TFRs. It is generally recognised that women in more advantaged occupations often postpone childbearing in contrast to those in less advantaged occupational groups. However, relatively little research has been conducted on men in similar terms. This paper contrasts the timing of first birth by occupational class between men and women using individual level data in a case study of Scotland. The data are an extract from the Scottish Longitudinal Study (SLS). This provides a 5.3% sample of the population of Scotland from the 1991 Census. The research applies the Cox proportional hazard model to estimate the speed to first birth during a period of observation between 1991 and 2006. Class is measured using NS-SEC 8 class analytic version. The model controls marital status, educational attainment, raised religion and urban-rural geography. It is found that ‘career men’ who occupy more advantaged occupational positions do not delay first birth in contrast to men in other occupational categories. This is in contrast to the well-known phenomenon of career women who have later childbearing. Our analysis shows that gender inequalities in how the social structure influences childbearing offer an avenue of explanation for wider patterns of social inequality.

Keywords: First birth, childbearing, occupation, timing, men, Scotland, gender, fertility

Background

Work within the fields of demography and population studies has highlighted a drop in European total fertility rates (TFR) to well below replacement (Kohler *et al.* 2002; Sabotka 2003; Billari and Kohler 2004; Goldstein *et al.* 2009). Kohler *et al.* (2002) argue that the phenomenon is typified by cohort delay in births, and especially first births. More recently however, Goldstein *et al.* (2009) noted the widespread rise in fertility rates which nevertheless remained at below replacement levels across Europe (Lutz *et al.* (Lutz *et al.* 2010). This fluctuation may be consistent with postponement of first births amongst birth cohorts from the 1970's onwards, and has therefore become referred to as the 'postponement transition' (Kohler *et al.* 2002; Billari and Kohler 2004; Aassve *et al.* 2006; Goldstein *et al.* 2009).

Empirical scholarship examining postponement highlights how processes of family formation and fertility intersect with social structure (Aassve *et al.* 2006; Timeaus and Moultrie 2008). For instance Mills *et al.* (2005) compare the effects of the structural context upon young people across countries. They suggest that occupational and educational structure impacts on fertility as an uneven distribution of risk results in later childbearing for some. Furthermore, it is generally recognised that women in more advantaged occupations often postpone childbearing in contrast to those in less advantaged occupational groups (Ekert-Jaffe *et al.* 2002; Mills *et al.* 2005; Nicoletti and Tanturri 2005). However, relatively little research has been conducted on men in similar terms (Zhang 2011).

Gender differences in childbearing may have considerable relevance to our understanding of how social inequalities and gender inequalities are inter-related. Many of the social differences between men and women can be attributed to their differential experiences of the child-rearing process (see Kulu and Washbrook; GROS 2012; Steele *et al.* 2013); equally, many observed national differences in patterns of social inequalities themselves are often linked to national differences in social support during childrearing (Hoem 1990; Strom 2010). Nonetheless, it is well known that whilst some gender inequalities (for instance, in educational attainment) have changed dramatically in character over recent

decades, other inequalities remain remarkably stable, for instance, occupational segregation by gender (cf. Washbrook *et al.* 2014).

Aims

This paper examines gender differences in the timing of first birth related to occupational structure using individual level data in a case study of Scotland. Like fertility elsewhere, Scotland's fertility rates had generally been declining following the baby boom of the 1960s, and, in 2002, fertility reached the lowest level recorded in Scottish history, a TFR of 1.48, a figure around the European average of the time, until thereafter experiencing a small and steady increase to recently reported levels of 1.67 in 2012 (GROS 2012). Contemporaneously, Scotland has experienced dramatic recent changes in certain dimensions of gender inequalities. There has been a significant reversal in male-female relative levels of educational attainment and participation (see Cleland 2002), and patterns of industrial restructuring that have led to a substantial increase in the proportion of relatively advantaged occupations in sectors with high levels of female workers (Murphy and Sullivan 1985; Maier *et al.* 2012). This co-evolution of trends in fertility, and social structural inequalities, offers insight into the nature of the postponement transition for men and women from recent birth cohorts.

It is well established that variations in a number of common social processes are strongly related to variations in childbearing. Examples include marriage and partnership formation, exits from education, and entrance into the workforce (e.g. Kohler *et al.*, 2006, Mills *et al.* 2006). However, in understanding the social inequalities linked to childbearing and childrearing, it is particularly relevant to explore how the wider context of an individual's position within the enduring structure of social advantage and disadvantage – position within the 'social stratification' structure, (see, Bottero 2005) - influences childbearing patterns. People within differently advantaged situations are constrained and enabled to act in differing ways (Irwin 2000) and stratification position itself is associated with considerable variations in patterns in other important processes such as marriage and exits from education (Da Rocha and Fuster 2006; Kohler *et al.* 2006; Black *et al.* 2008).

This analysis uses a sample of Scottish men and women born in 1975, with observations extending until individuals are in their early 30s. Those born in 1975, aged 27 in 2002 when Scotland's overall fertility reached its lowest point, might therefore be considered to represent Scotland's generation of low fertility, who may have postponed family formation and first birth longer than any other cohort in Scottish history. The findings reveal that occupational structure intersects with first birth timings in a contrasting manner for men and women. In line with findings elsewhere, it is shown that those who stay in education in Scotland delay fertility relative to their peers (Smith and Ratcliffe 2009) and that women who pursue careers also have later childbearing (Berrington 2004). However it is also found that 'career men' who occupy more advantaged positions are neither more nor less likely to have a first child before men in other occupational categories.

Data, methods and measures

Data

Contemporary Scotland benefits from rich longitudinal datasets linking national census responses with health, administrative and social survey records in a way that supports the analysis of different structural influences upon childbearing patterns (e.g. Understanding Society 2010; BHPS 2010; MCS 2010). The data used in this analysis is an extract from the Scottish Longitudinal Study (SLS) ⁽¹⁾. The SLS provides a representative 5.3% sample of the population of Scotland, based on 20 birth dates. The dataset uses 1991 and 2001 Census records, which are linked to various vital events registrations (Boyle *et al.* 2009). Explanatory variables are therefore only available at the 1991 and 2001 Census'.

The analysis below used measures of occupational class, educational attainment, geographies, marital status and gender. The outcome variable analysed was whether an individual had a birth during the period 1991 and 2006. The information on birth timing across the period 1991 to 2006 is taken from vital events data which is linked to the SLS. This outcome is enhanced with additional information regarding the timing of the birth,

linked from vital events records. The data is left censored, insofar as the SLS study design means that births occurring before 1991 cannot be reliably identified. However, given the age of the cohort under study (born in 1975), it is likely that the first birth observed between 1991 and 2006 will be the first child of the individual, an assumption that underpins the analysis below. Other sources tell us that the rate of pregnancy to girls under 16 in Scotland has been below 10 per 1000 across this period and that the majority of these end in termination rather than birth (see Information Services Division 2012). Whilst, the average age at first birth for a mother in Scotland in 2006 was 29.5, as compared to 27.4 in 1991 (GROS 2006).

To potentially identify and remove individuals from the cohort who may already have children an additional control was placed on the sample applying the logic of the own child method (Dubuc 2009; Coleman and Dubuc 2010). This method involves using the household grid variables and age characteristics to link parents to their children where there is no direct identification of this relationship in data. Here the Minimal Household Unit (Ermisch and Overton 1985) was used as an improved alternative to household grid indicators. Applying this control did not identify any of the cohort as living with their own dependent children. One reason for this might be that the small number of people who have children at such a young age could still be living with their own parents, making it difficult to identify the relationships without direct controls.

A total sample of 1632 women and 1307 men born in 1975 was analysed. These records exclude 720 men and 509 women who are missing at 2001 but were in the sample at 1991. There are also smaller numbers of item missing cases. The analysis excluded 112 women and 73 men that were missing on the NS-SEC variable at 2001, 17 men and 33 women whose marital status was missing at 2001 and 96 women and 72 men who did not record a level of qualification at 2001. Overall, the missing are unlikely to be missing completely at random (Heitjan and Basu 1996). Missing from the linkage between the 1991 and 2001 Census in the SLS is known to excessively include categories such as men, people aged 20-29, single and divorced men and those born outside the UK

(Hattersley and Boyle 2009). It is likely that these patterns of missing introduce an associated bias into the results and this is acknowledged as a limitation.

Methods

The Cox Proportional Hazard model (Cox 1972) was used to measure the relationship between various explanatory variables on the hazard rate of first birth. The hazard can be interpreted as the probability an individual will experience an event in the interval from time t to $t + s$, given that the individual has not experienced the event up until that point, and is at risk of the event in question (Allison 1984; Yamaguchi 1992).

A number of dummy variables were constructed which highlight the aggregate effects of state change upon the timing of first birth. For example, using the data available from the national censuses of 1991 and 2001, it is possible to observe and control for a change from no formal educational qualifications at Census 1991 (when the cohort turned 16 years old) to various levels of qualification by Census 2001 (when the cohort turned 26 years old). It is also possible to do the same for factors such as relationship status, occupational position or geographical location.

A key limitation of these analyses is that the range of social background measures incorporated in the analysis is substantially determined by the explanatory factors measured at the 2001 Census, since the respondents' socio-economic circumstances are generally only known and meaningful at Census 2001. A measured birth to a person in the sample can occur at any time, but their socio-economic circumstances are generally only known and meaningful at Census 2001, when the sample was aged around 26 years old. Therefore it is unknown whether a birth event occurred prior to entering the socio-economic 'state' in which an individual was measured at 2001. Accordingly, there are many potential gaps in the account of respondents' lives, such as information on previous or subsequent socio-economic circumstance out-with that held in 2001. Nevertheless, it is considered that variations in the timing of first birth observed, related to the explanatory measures included, are indicative of differing experience of social processes. In a sensitivity analysis, the younger 1976 birth year cohort was also modelled in the same

way as the 1975 sample. The results were consistent with the findings below, suggesting a level of robustness to the conclusions.

Measures

Whenever possible, factors considered likely to underlie fertility are controlled for in modelling. Table 1 summarises information on the measures used.

Firstly, Table 1 reports the numbers who experience a first birth whilst observed in these data between 1991 and 2006. Men in general are well known to have later family formation relative to their female peers (Paterson *et al.* 2004). This is evident in the SLS data, where by 2006, when the individuals in the cohort were in their early 30s, nearly 70% of the women in the sample have experienced a first birth, but only 50% of the men in the sample seem to have become a father by 2006. The frequencies reported here for men who become fathers might be slightly inaccurate as men are known to under report their parenthood in certain circumstances, such as following divorce (Greene and Biddlecom 2000). In the case of these data, where the information on first birth is based on birth registration data, were SLS members missing from registration data they would not be linked to the birth.

Family situation is known to influence childbearing decisions (Steele *et al.* 2005; Becker and Jakubowski 2008). In the SLS, this can be measured through data on legal marital status, which constitutes an imperfect but widely used proxy for family circumstances. As can be seen in Table 1, most of the cohort was unmarried at the last observation (in 2001) - less than 20% of men were married in 2001, but just over a quarter of women were married. There are also a number of people who have passed through a first marriage, and are either remarried, widowed or divorced. Less than 2% of men from the cohort have transitioned beyond first marriage by 2001, however over 7% of women have passed through their first marriage by 2001, meaning nearly a third of women born in 1975 had been married, at some stage, by 2001.

Table.1, Position of the 1975 birth cohort on socio-demographic variables by the 2001 Census and the % experiencing a birth by category

Variable	Men		Women	
	%	%birth	%	%birth
Marital Status				
Unmarried in 1991 - Unmarried in 2001	81.1	40.5	67.5	28.2
Unmarried in 1991 - Married in 2001	17.6	89.3	25.5	90.3
Unmarried in 1991 - Post marriage 2001	1.4	84.21	7.4	96.4
Level of Attainment				
No qualification in 91 - Degree and above 2001	22.8	33	22.8	51.6
No qualification in 91 - Further qualifications 2001	14.5	44.6	11.6	58.3
No qualification in 91 - High school 2- university entry level 2001	17.8	52.8	18.2	69.1
No qualification in 91 - High school 1 2001	44.8	59.5	47.4	80.8
NS-SEC - occupational categorisation				
Not in employment 91 - Professional and managerial 2001	9.9	39.2	5.9	40.7
Not in employment 91 -Lower professional 2001	16.5	43.5	21.2	57.5
Not in employment 91 -Intermediate occupations 2001	9.8	32.5	20.8	66.5
Not in employment 91 -Own account workers 2001	5.5	70.8	1.4	81
Not in employment 91 -Semi routine occupations 2001	16.9	57.7	5.8	69.8
Not in employment 91 -Lower technical occupations 2001	15.5	51	21.5	81.2
Not in employment 91 -Routine occupations 2001	17.3	62.7	10.6	82.7
Not in employment 91 -Long term unemployed 2001	3.7	40.4	3.7	89
Not in employment 91 –Student 2001	4.8	21.4	6.4	47.2
Raised Religion				
Catholic	17.4	53.2	17.5	72.8
Church of Scotland	39.3	41.6	35.3	64.6
Non-Christian	3.1	54.6	1.8	53.3
Other-Christian	8.0	54	8.6	61.3
Other-religion	0.7	33.3	0.6	50
No religion	31.5	57	36.3	76
Births	655		1130	
Mean age at first birth in the data	26.7		25.3	
N	1307		1632	

Notes: the table reports position at the 2001 Census, Marital Status controls for those unmarried at Census 1991, but married 2001, Level of Attainment controls for those with no qualifications at Census 1991 and level of attainment by 2001 and NS-SEC controls for those not in work at Census 1991 and occupational position at 2001. % birth reports the percent in each category who experience a birth whilst observed in the data, (column %, rounded up to one decimal place); Source SLS

The occupation-based measure of position in the stratification structure used is the UK National Statistics Socio-economic Classification (NS-SEC) eight category version based upon the respondent's occupation and employment status (Rose and Pevalin 2005). Because people are less likely to start families whilst in education (Mills *et al.*, 2005), an additional category to the standard classification is therefore included to indicate status as 'students'. The composite measure employed describes the relationship between the transition from no occupation at 1991 to occupational position at 2001 (see table 1). Dummy category coding is utilised (Aitken and West 1991), with the reference category combining the NS-SEC occupations denoted as the two most advantaged categories ('Employers in large organisations and Higher Managerial occupations', and 'Higher Professional occupations' (Rose and Pevalin, 2005). As is evident from Table 1 there are differences in the class profiles of men and women, with women disproportionately found in the 'lower professional', 'intermediate' and 'lower technical' NS-SEC

categories. To a large extent, the patterns reflect the impact of occupational segregation by gender (e.g. Blackburn *et al.* 2009).

The education measure incorporated in the models is also operationalised in a composite manner, controlling for the transition between no formal qualifications in 1991, to a range of educational attainment levels by 2001. Such categorical measures of educational attainment are considered to capture the *type* or *kind* (Schneider 2007) of education an individual has undertaken, and levels of educational attainment are known to relate to family formation timing and patterns (e.g. Berrington 2004; Steele *et al.* 2005; Miranda 2006). The contrast category in subsequent analysis is set as those with ‘degree level attainment and above’, and this is compared to those whose highest attainment are ‘further educational qualifications’, those with ‘upper high school level qualifications’, and those with lower levels of school qualifications. Table 1 outlines the various levels of educational attainment achieved by the cohort by 2001. The 10 years between 1991 and 2001 is the time in which most of those in the cohort will have completed their formal education. This can be seen as fewer than 5% of men and 7% of women are recorded as in education by around age 26 (see Table 1). However, the percentages achieving each attainment level suggest that the 1975 cohort experience little gendered difference in overall attainment, although subject area studied is likely to vary between men and women (Catsambis 1995; Warrington and Younger 2000) - a correspondence between men and women that is not matched by equivalence of occupational position.

The models presented below also include a measure of ‘raised religion’. Religious upbringing may influence childbearing through values associated with marriage or contraceptive practice (Grada and Walsh 1995; Macquillan 2004; Hayford and Morgan 2008). Also, in the case of Scotland, different religious groups are also associated with somewhat different socio-economic status for some cohorts (Mulder and Wagner 1998; Paterson *et al.* 2004). ‘Raised religion’ was measured with the reference category set as no religion contrasted with those from a ‘Church of Scotland’ (mainstream protestant) background, those who are ‘other Christians’, those of ‘other religions’ and those ‘Catholic’. Because of small numbers of cases, the ‘other’ categories are an amalgam of a

number of religions which are less widely practiced in Scotland. The legal marital status variable takes account of the transition from ‘single’ in 1991, to ‘married’, and the post-marriage states of ‘divorced’, ‘widowed’ and ‘separated’ by 2001. The reference category contains those single at time points 1991 and 2001.

Lastly, measures of geography are included as there is a literature highlighting geographical variation in childbearing in Scotland (Boyle *et al.* 2007a; Boyle *et al.* 2007b; Lutz *et al.* 2010). Geographical circumstances are measured in both 1991 and 2001, using the Scottish Household Surveys 6 fold urban rural classification (Granville and Mulholland 2009). Again, dummy coding is employed and the reference category are those from ‘cities’, contrasted with those in ‘towns’, ‘small accessible communities’, ‘small remote communities’, ‘accessible rural communities’ and ‘remote rural communities’. In background checking, social geography effects were also measured using the Townsend deprivation scale at the Output Area level (Townsend *et al.* 1988), and by using measures of population densities, although these did not lead to any major changes in results and so are not presented below.

Results

Tables 2 and 3 present models that estimate the association between various explanatory variables and the hazard of first birth to women (Table 2) and men (Table 3). The first model in each table shows the effect of the NS-SEC measure on the hazard rate (controlling only for marital status and urban/rural geography). The second and third models report the results controlling for all the independent variables and including urban/rural geography at different time points. Any difference in estimates on the geographical measures could be interpreted as an indication of an association between shift in location and timing of birth.

The relationship between occupational position and birth timing presents interesting results, particularly when comparing men and women. For men, we see that, without substantial controls, membership of a number of the relatively less advantaged social class categories is characterised by somewhat higher hazards of first birth (i.e. first births

at a younger age). However, when we consider the same relationship net of the effects of education and religion, it seems that occupational class for men has little influence upon the hazard of first birth (see Table 3, models 2 and 3, and Figure 1). An exception to this is the ‘Small employer and own account worker’ category (i.e. self-employed men, for instance those that run their own small businesses or commercial enterprises), who are characterised by somewhat higher hazard of first birth. In general however, for men there seems to be little influence associated with social stratification upon fertility postponement patterns, aside from that which is captured in the model as the effect of educational attainment.

By contrast, for women, the average differences between occupation-based social class categories in hazard of first birth are much larger, and are only slightly diminished by the addition of controls for educational attainment and religion (Table 2, models 2 and 3, and Figure 2). In general, the hazard of first birth is steadily higher the relatively less advantaged the occupational category, although an exception to this rule is that the small numbers of women who are ‘Small employers and own account workers’ also, like men, this group have a higher hazard of first birth than all other categories. These patterns are consistent with other research that has shown that women in more advantaged careers are relatively more likely to postpone childbearing (Aassve *et al.* 2006; Aassve *et al.* 2006; Timeaus and Moultrie 2008). These differences can potentially be interpreted as the influence of social stratification in the sense of power and control (for example, that women in more advantaged positions, better able to exercise their control, may be actively favouring postponement). On the other hand, it is equally possible that the differences in occupation-based class patterns relate to more operational differences in occupational experience, such as the differences in employment relations and career structures associated with the different occupational categories (for instance, that for women in less advantaged jobs there is relatively less pressure to develop a cumulative, full time career, that is difficult to combine with childbirth).

Table 2, Cox models estimating the hazard of first birth to women born in 1975

	Model 2.1	Model 2.2	Model 2.3
	β s.e.	β s.e.	β s.e.
None			
Catholic		-.06 (.09)	-.04 (.09)
Church of Scotland		-.2* (.08)	-.22** (.08)
Not Christian		-.84* (.4)	-.86* (.39)
Other Christian		-.09 (.18)	-.1 (.18)
Other religion		-.66 (1.0)	-.73 (1.0)
Single to single			
Single to married	.74*** (.07)	.77*** (.07)	.76*** (.07)
Single to post married	.84*** (.10)	.79*** (.1)	.8*** (.11)
Degree and higher			
Further education		-.004 (.12)	-.01 (.12)
High School 2		.27** (.11)	.27** (.1)
High School 1		.55*** (.1)	.55*** (.1)
Higher Professional			
Lower professionals	.55** (.17)	.49** (.18)	.47** (.18)
Intermediate occupations	.82*** (.18)	.59*** (.19)	.6*** (.19)
Small employers and own account workers	1.4*** (.3)	1.2*** (.3)	1.19*** (.3)
Semi routine occupations	.97*** (.21)	.7*** (.21)	.68*** (.21)
Lower technical occupations	1.4*** (.18)	1.0*** (.19)	1.0*** (.18)
Routine occupations	1.5*** (.19)	1.0*** (.2)	1.0*** (.20)
Long term unemployed	1.7*** (.2)	1.2*** (.21)	1.2*** (.21)
Student	.41 (.23)	.31 (.24)	.31 (.24)
City in 2001			
Town in 2001			.04 (.07)
Small accessible in 2001			-.06 (.10)
Small remote in 2001			-.17 (.18)
Accessible Rural in 2001			-.02 (.12)
Remote Rural in 2001			-.12 (.16)
City in 1991			
Town in 1991	-.08 (.07)	-.07 (.07)	
Small accessible in 1991	-.18 (.1)	-.13 (.1)	
Small remote in 1991	-.31 (.17)	-.29 (.17)	
Accessible Rural in 1991	-.27* (.11)	-.2 (.1)	
Remote Rural in 1991	-.26 (.14)	-.18 (.14)	
N	1653	1632	1632
First births	1147	1130	1130
Log likelihood	-7509	-7351	-7353

Notes: models controlling for the effects of raised religion, marital status, educational attainment, NS-SEC occupational category and SHS urban rural geography on the hazard of first birth to women born in 1975 SLS * p<0.05; ** p<0.01; *** p<0.001 (s.e.) the numbers of cases vary slightly between models because of missing cases associated with certain variables, source SLS

Additionally, Figure 1 includes quasi-variance (Gayle and Lambert 2007) confidence intervals associated with the coefficient estimate of the hazard of first birth for men and women by NS-SEC. Conventional dummy category coding expresses the estimated effect in relation to the reference category. In this manner a clear gradient of generally higher hazards of first birth is observed for women and not for men. The quasi-variance confidence intervals allow formal contrast between the other categories of the NS-SEC

variable (Firth 2003; Gayle and Lambert 2007). Comparing quasi-variance confidence intervals it can be seen that men in the routine occupations category have a slightly higher hazard of first birth than the men in the lower managerial and intermediate occupations categories, although the lower supervisory and semi-routine occupation categories exhibit no such significant contrasts. Overall the general pattern is confirmed for women where the hazards vary with the reference and between each other, with no clear pattern for men. The own account worker and small business owner category is an outlier for both men and women.

The differing relationship between timing of first birth and occupation-based class at age 26 for men and women appears to reflect different gendered processes in respect of becoming a parent within Scotland. Another indicator of this is the large positive effect on the hazard of first birth for long term unemployed females, in contrast to a non-significant effect for men. Many women in this category may deliberately not be in employment in order to perform roles associated with homemaking or child rearing (Brewster and Rindfuss, 2000), but for men in the UK, lack of paid work is rarely a preference and for those who experience it, it may well be problematic in terms of starting a family (Kohler *et al.* 2002; Sabotka 2004; Kohler *et al.* 2006).

The association of educational attainment and the hazard of first birth are as may be expected (e.g. Smith and Ratcliffe, 2009), with lower levels of education associated with higher hazards of first birth (i.e. first births occurring, on average, at a younger age). The magnitudes of the coefficients are slightly larger for women than they are for men – for instance, the difference between men that achieve only lower high school qualification and those who attain degrees is not as large as it is for women. These effects associated with education are likely in part to reflect the impact of educational institutional expansion, whereby extended participation in education into young adulthood is much easier without children. They can also, however, be expected to reflect average differences in social circumstances related to the social organisation of inequality itself – within the birth cohort, the more socially advantaged will typically have higher levels of education, so the persistent effects of education also give us some indication that social

stratification position is associated with first birth patterns for both men and women through the medium of education.

Controlling for religion elicits negative effects for those who are religious in comparison to the non-religious reference category. However, the only association which is consistently statistically significant for both men and women is the lower hazard rate for those who describe their background as 'Church of Scotland'. The 'Not Christian' category is significant for women, but not for men and the Catholic category in one of the models is significant for men. It is possible that these differences may reflect additional variation in socio-economic circumstances of people in different denominations (that is not fully captured in other controls). However it is also plausible that religious teaching has some effect on the timing and circumstances of childbearing in Scotland, net of the other factors modelled (Moulasha and Rama Rao 1999; Philipov and Berghammer 2007). This could relate to patterns of, for example, delayed relationship formation of those from the Church of Scotland in comparison to those who are not religious.

As would be expected, the findings here show that the tempo of first birth remains strongly related to marriage in Scotland, with marriage by age 26 associated with higher hazard of first birth in the cohort. In many countries, births are becoming more common outside marriage (Kohler *et al.* 2006), and we should note that within our data a recorded birth event can occur at any time between 1991 and 2006, so in some instances marriage formation will have followed a first birth, rather than preceded it. However, this finding is consistent with the interpretation that marriage is widely seen as part of the social circumstances in which people have and raise children. Interestingly, the effects of marital status that are reported for men are larger than the effects for women. This suggests that marriage may be a more important social marker for men than for women with regard to childbearing patterns (although it might also reflect the likelihood that some single men from the sample may in fact have had children but are not attached to the birth records for their child - e.g. Greene and Biddlecom, 2000).

Table 3, Cox models estimating the hazard of first birth to men born in 1975

	Model	3.1	Model	3.2	Model	3.3
	β	<i>s.e.</i>	β	<i>s.e.</i>	β	<i>s.e.</i>
None			-	-	-	-
Catholic			-.24*	(.12)	-.19	(.11)
Church of Scotland			-.43***	(.09)	-.41***	(.09)
Not Christian			-.77	(.43)	-.66	(.43)
Other Christian			-.33	(.19)	-.38	(.2)
Other religion			-1.0	(1.0)	-.9	(1.0)
Single to single	-	-	-	-	-	-
Single to married	1.32***	(.08)	1.35***	(.09)	1.35***	(.9)
Single to post married	1.41***	(.26)	1.56***	(.26)	1.54***	(.26)
Degree and higher			-	-	-	-
Further education			.39*	(.16)	.36*	(.16)
High School 2			.42**	(.15)	.38*	(.15)
High School 1			.55***	(.14)	.53***	(.14)
Higher Professional	-	-	-	-	-	-
Lower professionals	-.03	(.18)	-.22	(.19)	-.21	(.18)
Intermediate occupations	-.07	(.21)	-.26	(.22)	-.27	(.22)
Small employers and own account workers	.92***	(.20)	.51*	(.23)	.46*	(.23)
Semi routine occupations	.61***	(.17)	.2	(.19)	.16	(.19)
Lower technical occupations	.57***	(.17)	.18	(.19)	.18	(.19)
Routine occupations	.72***	(.17)	.32	(.19)	.31	(.19)
Long term unemployed	.28	(.27)	-.1	(.29)	-.06	(.28)
Student	-.36	(.36)	-.58	(.37)	-.59	(.37)
City in 2001					-	-
Town in 2001					.09	(.1)
Small accessible in 2001					.28	(.14)
Small remote in 2001					.27	(.25)
Accessible Rural in 2001					.02	(.14)
Remote Rural in 2001					.03	(.19)
City in 1991	-	-	-	-		
Town in 1991	.01	(.1)	.04	(.1)		
Small accessible in 1991	-.02	(.14)	-.02	(.14)		
Small remote in 1991	.07	(.23)	.05	(.25)		
Accessible Rural in 1991	-.18	(.12)	-.15	(.13)		
Remote Rural in 1991	-.2	(.18)	-.13	(.19)		
n	1329		1307		1307	
First births	665		655		655	
Log likelihood	-4222		-4124		-4123	

Notes: models controlling for the effects of raised religion, marital status, educational attainment, NS-SEC occupational category and SHS urban rural geography on the hazard of first birth to women born in 1975 SLS
 * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$ (s.e.) the numbers of cases vary slightly between models because of missing cases associated with certain variables, source SLS

Finally, there are no significant geographical effects apparent using the urban/rural measures and net of the other explanatory variables in the models (nor is there any evidence that change in geographical location is an important driver of mobility, since the effects in models 2.2/2.3 and 3.2/3.3 are not substantially different). This suggests that how men and women enter parenthood is uninfluenced by whether they are from an urban or rural context at onset of their main reproductive years (net of other controls). Other

standard geographies were tested and in general the results were unchanged. The findings echo Boyle *et al.* (2007b), suggesting that there is little high-level geographical variation in fertility.

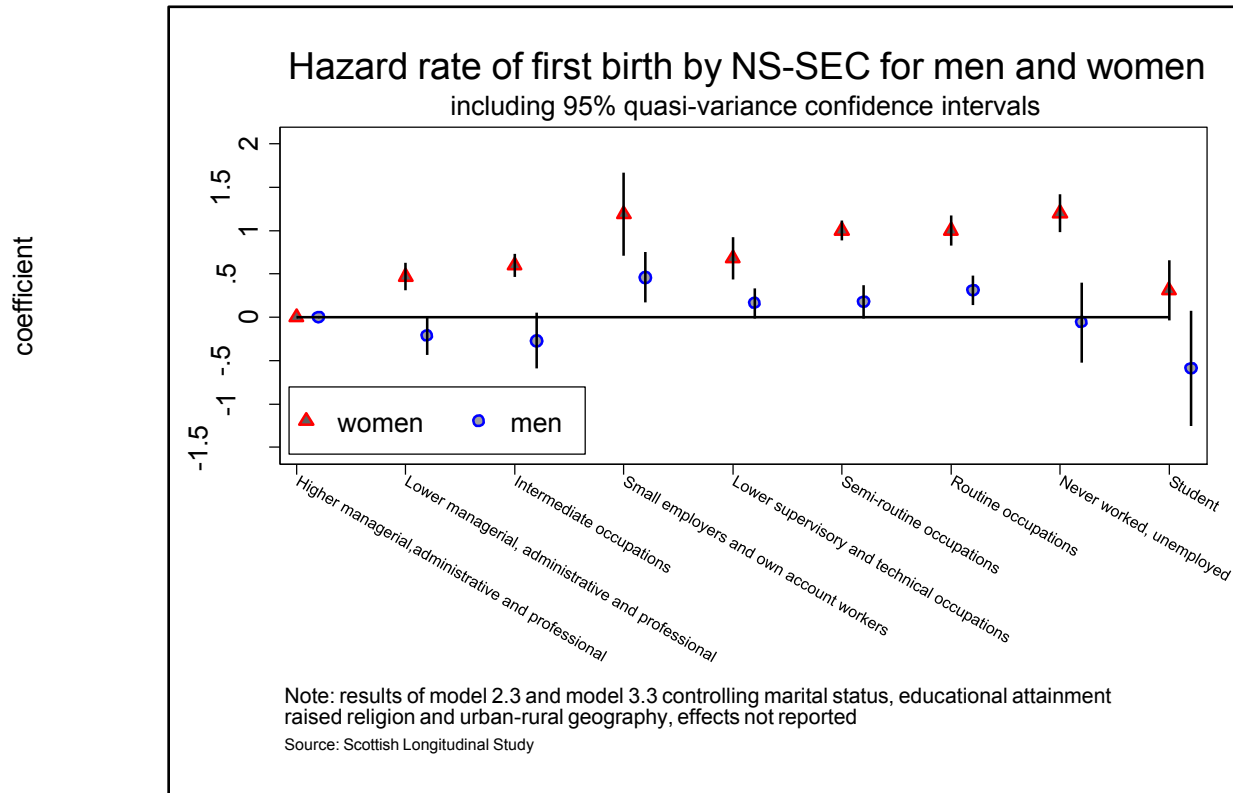


Figure1

Concluding

Thoughts

Cohort postponement in fertility is understood to be a characteristic of low and ‘lowest low’ fertility in contemporary societies (Sabotka 2003; Sabotka 2004; Kohler *et al.* 2006). Postponement is not evenly distributed in the population, and it is well documented that women who pursue careers and remain in education tend to have later fertility (e.g. Nicoletti and Tanturri 2005; Miranda 2006). Until recently there has not been an equivalent research focus on men (Zhang 2011). There are different biological and social roles that men and women have in respect of parenting and this analysis finds contrasting trends in the timing of a birth between men and women. Men who remain in

education postpone, like their female counterparts, but net of this pattern, the occupational circumstances of men do not appear to influence the timing of their first child in the same manner as women.

Research has suggested certain occupations or occupational trajectories which are more compatible with early childbearing for women (Caucutt *et al.* 2002; Martin Garcia 2010), and our evidence similarly demonstrates occupation-based social categories for women are associated with different childbirth patterns, suggesting for instance that educational and occupational advantage can act as a double delaying mechanism for women. For men, the same patterns do not appear to arise. Lack of work may be associated with later rather than earlier childbirth, whereas men in occupational categories are not generally substantially different in their childbirth patterns (net of the effects of education). Of further note is the relatively high hazard of first birth for both men and women who are in the category of 'Own account workers and small business owners'. It could be that work in this occupational group is more compatible with early first births due to the enabling power of conditions of employment or flexibility. It is also possible that this pattern reflects a mechanism whereby those elements of stratification advantage that are unrelated to educational attainment can facilitate less postponement (in general, those in this category can be described as having relatively advantaged financial circumstances without holding correspondingly high levels of educational attainment). However, it is also possible that there are other cultural or social characteristics that differentiate people in these types of occupations and are not otherwise measured in our analysis.

The results imply that what constitutes 'advantage' when it comes to realising childbearing aspirations is open to question. Women who are less well educated and in occupations that are relatively less advantaged often start families before those in categories that would be considered more advantaged. Indeed Mills *et al.*, (2005) generalise that there are two types of young women - those who focus early upon family and those who pursue careers. Whether the delay we see amongst educated and advantaged women constitutes a positive choice, or an enforced compromise, is debatable. For instance it is plausible to conceptualise a choice to focus on a career and wait to have children as positive, free action, which in the long term may well benefit both the parent and child such as through improved material circumstances or improved life skills in parenting itself (Bradley 2000; Caucutt *et al.* 2002). On the other hand, later

childbearing may be a reaction to social and economic pressures such as to develop an extended career or complete an educational level prior to having a child, even amongst people who might otherwise prefer to have a child earlier (Caucutt *et al.* 2002). In this sense waiting to have a first child would be the result of more negative pressures, and might introduce other negative effects such as greater risks of poorer health outcomes associated with later childbearing (Leader 2006).

More generally, the analysis highlights that influences upon family formation work differently for men and women. Other patterns in fertility trends in Scotland are similar to those in other countries, so it is plausible that the gender differences observed in Scotland may also be found in other societies. Whilst attention to gender inequalities is a major domain of contemporary social policies, and the impact of childbearing and childrearing is widely seen as one of the biggest sources of difference between male and female experiences, it is apparent from our analysis that gender inequalities in how the social structure influences childbearing offer an avenue of explanation for wider patterns of *social inequality*. Research examining couple level associations and how the relationship between social class and occupational advantage of partners, together, relate to patterns of birth timings could take understanding forward. Considering family units in this way could have implications for our understanding of how gendered inequalities play out.

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References

- AASSAVE, A., Billari, F. and Spéder, Z. 2006. Societal Transition, Policy Changes and Family Formation: Evidence from Hungary. *European Journal of Population/Revue européenne de Démographie*, Vol. 22, p. 127-152.
- AASSAVE, A., Burgess, S., Propper, C. and Dickson, M. 2006. Employment, family union and childbearing decisions in Great Britain. *Journal of the Royal Statistical Society: Series A (Statistics in Society)*, Vol. 169, p. 781-804.
- AITKEN, L. S. and West, G. S. 1991. *Multiple Regression: Testing and Interpreting Interactions*, London, Sage.
- ALLISON, P. D. 1984. *Event History Analysis : Regression for Longitudinal Event Data*. London, Sage.
- BECKER, T. L. and Jakubowski, J. 2008. Fertility Timing Within Marriage: Are Changing Contexts Associated with Changing Dynamics? *The Annual Meeting of the Population Association of America*. Detroit.
- BERRINGTON, A. 2004. Perpetual Postponers? Women's, Men's and Couples' Fertility Intentions and Subsequent Fertility Behaviour. *Population Trends*, Vol. 117, p. 9-19.
- BHPS. 2010. University of Essex. Institute for Social and Economic Research N. C. F. S. R. British Household Panel Survey: Waves 1-17, 1991-2008 [computer file] Colchester, Essex: UK Data Archive [distributor] December 2010 SN: 6614.
- BILLARI, F. and Kohler, H. P. 2004. Patterns of low and low-lowest Fertility in Europe. *Population Studies*, Vol. 58, p. 161-176.
- BLACK, S. E., Devereux, P. J. and Salvanes, K. G. 2008. Staying in the Classroom and out of the Maternity Ward: The Effect of Compulsory Schooling Laws on Teenage Births. *The Economic Journal*, Vol. 118, p. 1025-1054.
- BLACKBURN, R. M., Racko, G. and Jarman, J. 2009. Gender Inequality at Work in Industrial Countries. *Cambridge Studies in Social Research*, No 11, SSRG Publications. Cambridge.
- BOTTERO, W. 2005. *Stratification: Social Division and Inequality*, London, Routledge.
- BOYLE, P., Graham, E. and Feng, Z. 2007a. Fertility Variations in Scotland: Geographical Influences in Wasoff, F. and Morton, S (Eds.) *Centre for Research on Families and Relationships: Research Briefings 33*. Edinburgh.

BOYLE, P., Graham, E. and Feng, Z. 2007b. Contextualising demography: the Significance of Local Clusters of Fertility in Scotland. *MPIDR Working Paper, WP2007-036*. Rostock.

BOYLE, P. J., Feijten, P., Feng, Z., Hattersley, L., Huang, Z., Nolan, J. and Raab, G. 2009. Cohort Profile: The Scottish Longitudinal Study (SLS). *International Journal of Epidemiology*, Vol. 38, p. 385-392.

BRADLEY, K. 2000. The Incorporation of Women into Higher Education: Paradoxical Outcomes? *Sociology of Education*, Vol. 73, p. 1-18.

CATSAMBIS, S. 1995. Gender, race, ethnicity, and science education in the middle grades. *Journal of Research in Science Teaching*, Vol. 32, p. 243-257.

CAUCUTT, E. M., Guner, N. and Knowles, J. 2002. Why Do Women Wait? Matching, Wage Inequality, and the Incentives for Fertility Delay. *Review of Economic Dynamics*, Vol. 5, p. 815-855.

CLELAND, J. 2002. Education and Future Fertility Trends, with Special Reference To Mid-transitional Countries. Completing the Fertility Transition. Available: <<http://huwu.org/esa/population/publications/completingfertility/RevisedCLELANDpaper.PDF>> [Accessed 19/12/10].

COLEMAN, D. A. and Dubuc, S. 2010. The Fertility of Ethnic Minorities in the UK, 1960s-2006. *Population Studies*, Vol. 64, p. 1-23.

COX, D. R. 1972. Regression Models and Life Tables. *Journal of the Royal Statistical Society, Series B (Methodological)*, Vol. 34, p. 187-220.

DA ROCHA, J. M. and Fuster, L. 2006. Why are Fertility Rates and Female Employment Ratios Positively Correlated Across O.E.C.D. Countries. *International Economic Review*, Vol. 47, p. 1187-1222.

DUBUC, S. 2009. Application of the Own-Child method for estimating fertility of women by ethnic groups in the UK. *OXPOP Working Paper, 47*. Oxford.

EKERT-JAFFE, O., Joshi, H., Lynch, K., Mougin, R., Rendell, M. and Shapiro, D. 2002. Fertility Timing of Births and Socio-economic Status in France and Britain: Social Policies and Occupational Polarization. *Population (English Edition)*, Vol. 57, p. 475-507.

ERMISCH, J. F. and Overton, E. 1985. Minimal Household Units: A New Approach to the Analysis of Household Formation. *Population Studies*, Vol. 39, p. 33-54.

FIRTH, D. 2003. Overcoming the Reference Category Problem in the Presentation of Statistical Models. *Sociological Methodology*, Vol. 33, p. 1-18.

- GAYLE, V. and Lambert, P. S. 2007. Using Quasi-variance to Communicate Sociological Results from Statistical Models. *Sociology*, Vol. 41, p. 1191-1208.
- GOLDSTEIN, J. R., Sabotka, T. and Jasilioniene, A. 2009. The End of 'Lowest-Low' Fertility? *Population and Development Review*, Vol. 35, p. 663-699.
- GRADA, C. Ó. and Walsh, B. 1995. Fertility and Population in Ireland, North and South. *Population Studies*, Vol. 49, p. 259-279.
- GRANVILLE, S. and Mulholland, S. 2009. Use and Understanding of the Scottish Government Urban Rural Classification. *Scottish Government Publication*, Edinburgh: Scottish Government.
- GREENE, M. and Biddlecom, A. 2000. Problematic men: Demographic Accounts of Male Reproductive Roles. *Population and Development Review*, Vol. 26, p. 81-115.
- GROS 2006. Scotland's Population 2005: The Registrar General's Review of Demographic Trends, 151st Edition, Edinburgh: General Registrars Office.
- GROS 2012. Scotland's Population 2009: The Registrar General's Annual Review of Demographic Trends 158th Edition. Edinburgh: General Register Office for Scotland.
- HATTERSLEY, L. and Boyle, P. 2009. The 1991–2001 Scottish Longitudinal Study Census Link, Edinburgh, LSCS & General Register Office for Scotland.
- HAYFORD, S. R. and Morgan, P. S. 2008. Religiosity and Fertility in the United States: The Role of Fertility Intentions. *Social Forces*, Vol. 86, p. 1163-1188.
- HEITJAN, D. F. and Basu, S. 1996. Distinguishing “Missing at Random” and “Missing Completely at Random”. *The American Statistician*, Vol. 50, p. 207-213.
- HOEM, J. M. 1990. Social Policy and Recent Fertility Change in Sweden. *Population and Development Review*, Vol. 16, p. 735-748.
- INFORMATION Services Division 2012. Teenage Pregnancy: Scotland, Publication Report: Information Services Division. Scotland: NHS.
- IRWIN, S. 2000. Reproductive Regimes: Changing Relations of Interdependence and Fertility Change. *Sociological Research Online*, Vol. 5, <<http://www.socresonline.org.uk/5/1/irwin.html>>
- KOHLER, H. P., Billari, F. and Ortega, J. A. 2002. The Emergence of Lowest-Low Fertility in Europe during the 1990s. *Population and Development Review*, Vol. 28, p. 641-680.

- KOHLER, H. P., Billari, F. and Ortega, J. A. 2006. Low Fertility in Europe: Causes, Implications and Policy Options in Harris, F. R (Ed) *The Baby Bust: Who Will do the Work? Who Will Pay the Taxes?* Lanham MD: Rowman and Littlefield.
- KULU, H. and Washbrook, E. Residential context, migration and fertility in a modern urban society. *Advances in Life Course Research*, Vol. 21, p.168-182.
- LEADER, A. 2006. Pregnancy and motherhood: The biological clock. *Sexuality Reproduction and Menopause*, Vol. 4, p. 3-6.
- LUTZ, W., Mamolo, M., Scherbov, S., Sabotka, T. and Zeman, K. 2010. The European Demographic Datasheet 2010. Vienna Institute of Demography, International Institute for Applied Systems Analysis, Austrian Academy of Sciences .
- MACQUILLAN, K. 2004. When Does Religion Influence Fertility? *Population and Development Review*, Vol. 30, p. 25-56.
- MAIER, W., Fairburn, J. and Mielck, A. 2012. Regional deprivation and mortality in Bavaria. Development of a community-based index of multiple deprivation. *Gesundheitswesen*, Vol. 74, p. 416-25.
- MARTIN GARCIA, T. 2010. The Impact of Occupational Sex-Composition on Women's Fertility in Spain. *European Societies*, Vol. 12, p. 113-133.
- MCS 2010. Millenium Cohort Study: Fourth Survey, 2008 [computer file]. Colchester, Essex: UK Data Archive [distributor]: November 2010 SN: 5151.
- MILLS, M. Blossfeld, H. P. and Klijzing, E. 2005. Becoming an Adult in Uncertain Times: A 14 Country Comparison of the Losers of Globalization. in: Blossfeld, H. P, Klijzing, E, Mills, Mand Kurz, K (Eds) *Globalization, Uncertainty and Youth in Society: The Losers in a Globalizing World* London: Routledge.
- MIRANDA, A. 2006. Are young cohorts of women delaying first birth in Mexico? *Journal of Population Economics*, Vol. 19, p. 55-70.
- MOULASHA, K. and Rama Rao, G. 1999. Religion-Specific Differentials in Fertility and Family Planning. *Economic and Political Weekly*, Vol. 34, p. 3047-3051.
- MULDER, C. H. and Wagner, M. 1998. First-time Home-ownership in the Family Life Course: A West German-Dutch Comparison. *Urban Studies*, Vol. 35, p. 687-713.
- MURPHY, M. J. and Sullivan, O. 1985. Housing Tenure and Family Formation in Contemporary Britain. *European Sociological Review*, Vol. 1, p. 230-243.

- NICOLETTI, C. and Tanturri, M. L. 2005. Differences in delaying motherhood across European countries: empirical evidence from the ECHP. *Institute for Social and Economic Research Working Paper*. Wivenhoe: ISER.
- PATERSON, L., Bechhofer, F. and McCrone, D. 2004. *Living in Scotland: Social and Economic Change since 1980*, Edinburgh: Edinburgh University Press.
- PHILIPPOV, D. and Berghammer, C. 2007. Religion and fertility ideals, intentions and behaviour: a comparative study of European countries. *Vienna Yearbook of Population Research*, p. 271-305.
- ROSE, D. and Pevalin, D. J. 2005. *The National Statistics Socio-economic Classification: Origins, Development and Use*, Houndmills, Basingstoke: Palgrave-Macmillan.
- SABOTKA, T. 2003. Tempo-quantum and period-cohort interplay in fertility changes in Europe. *Demographic Research*, Vol. 8, p.151-214.
- SABOTKA, T. 2004. *Postponement of childbearing and low fertility in Europe*, Amsterdam: Dutch University Press.
- SCHNEIDER, S. L. 2007. Measuring Educational Attainment in Cross-National Surveys: The Case of The European Social Survey. EDUC Research Group Workshop of EQUALSOC. Dijon.
- SMITH, S. and Ratcliffe, A. 2009. Womens Education and Childbearing: A Growing Divide. In: Stillwell, J. , Coast, E. and Kneale, D. (Eds) *Fertility, Living Arrangements, Care and Mobility*. London: Springer.
- STEELE, F., Clarke, P. and Washbrook, E. 2013. Modeling Household Decisions Using Longitudinal Data from Household Panel Surveys, with Applications to Residential Mobility. *Sociological Methodology*, Vol. 43, p. 220-271.
- STEELE, F., Constantinos, K., Goldstein, H. and Joshi, H. 2005. The Relationship Between Childbearing and Transitions From Marriage and Cohabitation in Britain. *Demography*, Vol. 42, p. 647-673.
- STROM, S. 2010. Housing and First Births in Sweden, 1972-2005. *Housing Studies*, Vol. 25, p. 509-526.
- TIMEAUS, I. M. and Moultrie, T. A. 2008. On Postponement and Birth Intervals. *Population and Development Review*, Vol. 34, p. 483-510.
- TOWNSEND, P., Phillimore, P. and Beattie, A. 1988. *Health and deprivation: inequality and the North*, Bristol: Croom Helm.

UNDERSTANDING Society 2010. University of Essex. Institute for Social and Economic Research, N. C. F. S. R. Understanding Society: Wave 1, Year, 2009 [computer file]. Colchester, Essex: UK Data Archive [distributor] December 2010 SN: 6614.

WARRINGTON, M. and Younger, M. 2000. The Other Side of the Gender Gap. *Gender and Education*, Vol. 12, p. 493-508.

WASHBROOK, E., Clarke, P. S. and Steele, F. 2014. Investigating non-ignorable dropout in panel studies of residential mobility. *Journal of the Royal Statistical Society: Series C (Applied Statistics)*, Vol 63, p. 239-266.

YAMAGUCHI, K. 1992. *Event History Analysis*, London: Sage.

ZHANG, L. 2011. *Male Fertility Patterns and Determinants*, London: Springer.